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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,129	01/11/2006	Toshimi Nakamura	Q91344	8865

23373 7590 10/17/2007

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EXAMINER	
SHABMAN, MARK A	

ART UNIT	PAPER NUMBER
4131	

MAIL DATE	DELIVERY MODE
10/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,129	NAKAMURA ET AL.	
	Examiner	Art Unit	
	Mark Shabman	4131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-19,22,24,26-29,32 and 36-39* is/are rejected.

7)☒ Claim(s) *20,21,23,25,30,31 and 33-35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/11/06 and 03/03/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

Figures 17 and 18 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 24, 26, 37 and 38 are rejected under 35 U.S.C. 102(a) as being anticipated by the applicant cited prior art.

Regarding **claim 24**, the cited prior art discloses a "liquid retaining portion including a space configured to retain liquid flown into the leak detector" as seen in figure 17 between the areas of measuring unit 111 and liquid level LS2. This liquid is

part of the liquid of the tank. A "flow path portion" is located at the bottom of the detector 110 allowing the fluid from the tank to flow into the space of detector 110 through measurement unit 111 as described in paragraph [0003], thus reading on "a flow path portion through which the space communicates with an interior of the tank and through liquid flows in and out." Paragraph [0004] describes the capability to close of ventilating path 112a to stop the flow of gas in and out of the leak detector. This ability to close the pathway reads on the "flow path opening/closing unit configured to open and close at least one end of the flow path portion." There exists a "flow-rate measuring unit" similar to the one claimed in the prior art which would measure the rate of flow of liquid flowing into and out of the flow path portion of the detector 110, reading on the flow-rate measuring unit as claimed. Paragraph [0004] describes a method for calibrating the leak detector 110. Since the reference value calculated is for liquid-flow-rate, this reads on the "calibrating unit" as claimed and it is "configured to calibrate the flow-rate measuring unit."

Regarding **claim 26**, paragraph [0004] of the cited prior art describes a method of calibration by taking a temperature reading within the leak detector while the liquid is stopped. This reads on calibrating "the flow-rate measuring unit based on a signal corresponding to temperature of liquid being inside the flow path portion without flowing."

Regarding **claim 37**, the prior art teaches a flow rate sensor that operates by liquid passing through it. In order for liquid to pass through the flow rate measurement unit 111, the "inlet/outlet portion" would be near the bottom with the sensor below the

flow-rate measuring unit 111, reading on "near the first end through which the liquid flows in and out of the liquid detector." This further reads on "a flow rate measuring unit arranged near the liquid inlet/outlet portion" as claimed. As the flow rate measuring unit is located above the inlet/outlet portion, it is "toward the second end". Since it measures the flow rate of the liquid which enters the inlet/outlet below, as the water level rises or falls the amount of water passing through the measuring unit corresponds to inlet/outlet potion, thus the measuring unit measures "an amount of flow of the liquid occurring through the liquid inlet/outlet portion". As can be seen in figure 17, the liquid level LS2 within the leak detector 110 corresponds to the liquid level of the tank itself LS1. The LS2 is described in paragraph [0003] as inside the leak detector. This liquid between the measuring unit 111 and the "second end", is the "liquid retaining portion" as claimed. The liquid within this space has entered "through the liquid inlet/outlet portion."

Regarding **claim 38**, the cited prior art discloses a "liquid retaining portion including a space configured to retain liquid flown into the leak detector" as seen in figure 17 between the areas of measuring unit 111 and liquid level LS2. This liquid is part of the liquid of the tank. A "flow path portion" is located at the bottom of the detector 110 allowing the fluid from the tank to flow into the space of detector 110 through measurement unit 111 as described in paragraph [0003], thus reading on "a flow path portion through which the space communicates with an interior of the tank and through liquid flows in and out." Paragraph [0004] describes the capability to close of ventilating path 112a to stop the flow of gas in and out of the leak detector. This ability to close the pathway reads on the "flow path opening/closing unit configured to open

and close at least one end of the flow path portion." There exists a "flow-rate measuring unit" similar to the one claimed in the prior art which would measure the rate of flow of liquid flowing into and out of the flow path portion of the detector 110, reading on the flow-rate measuring unit as claimed. Paragraph [0004] describes a method for calibrating the leak detector 110. Since the reference value calculated is for liquid-flow-rate, this reads on the "calibrating unit" as claimed and it is "configured to calibrate the flow-rate measuring unit." The cited prior art further describes a method of calibrating the leak detector by use of a measured reference value. Since calibration requires adjustment of the detector, a "controller" must be present to control this adjustment, thus reading on the "controller configured to control the leak detector" as claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 16-18, 22, 28, 29, 32, 36 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art in view of Lagergren US patent 4,732,035 (hereinafter referred to as Lagergren) in further view of Maresca US Patent 5,950,487 (hereinafter referred to as Maresca).

Regarding **claim 16**, figure 17 of the present application shows a "conventional leak detector" in a tank for detection of leaks within the tank itself. Item 110 is described as a liquid leak detector in paragraph [0003], thus reading on the "leak detector for detecting leakage of liquid stored in a tank" as claimed. As a tank leaks, the leak rate would be based on "fluctuation in a liquid level of the liquid". The tank shown in figure 17 can be seen to have a "top plate" and a "bottom plate" as claimed along with a perpendicular plate along the side connecting said top and bottom plates, which is interpreted as the "side plate" as claimed. The cap 112 of the leak detector is placed in a "through opening" in the top plate with the rest of the device extending inside the tank towards the bottom plate, perpendicular to the surface of the liquid LS2 within. The prior art does not disclose the first end of the leak detector being "detachably attached to the bottom plate or the "second end supported in the through opening in such a manner that the leak detector is movable in a direction substantially perpendicular to the surface of the liquid."

Lagergren discloses a method and apparatus for storage tank leak detection having temperature compensation in which a pressure tube 24 is inserted into a tank vertically through a riser pipe 16 as seen in the figures and column 4 lines 16-20. As there is nothing holding the horizontal position of the tube constant, it would be possible to move it vertically within the riser pipe i.e. perpendicularly to the liquid level of the tank. Lagergren further states that the bottom end of the tube is installed adjacent the base of the tank. The bottom end of the tube is not however "detachably attached to the base" as claimed.

Maresca discloses a gauge for measuring liquid levels of a float variety. Figure 1A shows a vertical scale component 12 and a weight 14 attached to the bottom in order to secure it in a vertical position. Column 15 lines 23-31 describe figure 12E disclosing an embodiment in which the weight is replaced with a magnet 298 attaching it to the base weight 296 or another magnet 300. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the base attachment method of Maresca with the vertical pressure tube of Lagergren in order to further secure the tube in a vertical position or if the tank was located above ground and the riser pipe support was not as long.

It would have been obvious to one of ordinary skill in the art at the time of invention to extend the leak detection unit of the prior art to the bottom of the tank as taught by Maresca and Lagergren in case the leak forms while there is a low liquid level in the tank, thus allowing the leak detection unit to function properly. Further, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the mounting teachings of Lagergren in view of Maresca with the admitted prior art to ensure a strong vertical support for a lowered leak detector since any change in angle from perpendicular to the liquid would cause the potential leak rate to be miscalculated as higher than it truly is.

Regarding **claim 17**, the prior art teaches a flow rate sensor that operates by liquid passing through it. In order for liquid to pass through the flow rate measurement unit 111, the "inlet/outlet portion" would be near the bottom with the sensor below the flow-rate measuring unit 111, reading on "near the first end through which the liquid

flows in and out of the liquid detector." This further reads on "a flow rate measuring unit arranged near the liquid inlet/outlet portion" as claimed. As the flow rate measuring unit is located above the inlet/outlet portion, it is "toward the second end". Since it measures the flow rate of the liquid which enters the inlet/outlet below, as the water level rises or falls the amount of water passing through the measuring unit corresponds to inlet/outlet potion, thus the measuring unit measures "an amount of flow of the liquid occurring through the liquid inlet/outlet portion". As can be seen in figure 17, the liquid level LS2 within the leak detector 110 corresponds to the liquid level of the tank itself LS1. The LS2 is described in paragraph [0003] as inside the leak detector. This liquid between the measuring unit 111 and the "second end", is the "liquid retaining portion" as claimed. The liquid within this space has entered "through the liquid inlet/outlet portion."

Regarding **claim 18**, Maresca discloses an embodiment in which the "first end is detachably attached to the bottom plate with a magnet." It would have been obvious to one of ordinary skill in the art at the time of invention to combine the base attachment method of Maresca with the vertical pressure tube of Lagergren in order to further secure the tube in a vertical position or if the tank was located above ground and the riser pipe support was not as long.

Regarding **claim 22**, figure 12E of Maresca and lines 28-31 disclose an embodiment in which an intermediate member 298 is a magnet, arranged at the bottom of the tank, thus on the bottom of the leak detector, attaching the detector to the bottom plate as claimed. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the base attachment method of Maresca with the vertical

pressure tube of Lagergren in order to further secure the tube in a vertical position or if the tank was located above ground and the riser pipe support was not as long.

Regarding **claim 28**, the cited prior art discloses a "liquid retaining portion including a space configured to retain liquid flown into the leak detector" as seen in figure 17 between the areas of measuring unit 111 and liquid level LS2. This liquid is part of the liquid of the tank. A "flow path portion" is located at the bottom of the detector 110 allowing the fluid from the tank to flow into the space of detector 110 through measurement unit 111 as described in paragraph [0003], thus reading on "a flow path portion through which the space communicates with an interior of the tank and through liquid flows in and out." Paragraph [0004] describes the capability to close of ventilating path 112a to stop the flow of gas in and out of the leak detector. This ability to close the pathway reads on the "flow path opening/closing unit configured to open and close at least one end of the flow path portion." There exists a "flow-rate measuring unit" similar to the one claimed in the prior art which would measure the rate of flow of liquid flowing into and out of the flow path portion of the detector 110, reading on the flow-rate measuring unit as claimed. Paragraph [0004] describes a method for calibrating the leak detector 110. Since the reference value calculated is for liquid-flow-rate, this reads on the "calibrating unit" as claimed and it is "configured to calibrate the flow-rate measuring unit." The prior art does not disclose the manner of mounting the leak detector as claimed.

Lagergren discloses a method and apparatus for storage tank leak detection having temperature compensation in which a pressure tube 24 is inserted into a tank vertically through a riser pipe 16 as seen in the figures and column 4 lines 16-20. As there is nothing holding the horizontal position of the tube constant, it would be possible to move it vertically within the riser pipe i.e. perpendicularly to the liquid level of the tank. Lagergren further states that the bottom end of the tube is installed adjacent the base of the tank. The bottom end of the tube is not however "detachably attached to the base" as claimed.

Maresca discloses a gauge for measuring liquid levels of a float variety. Figure 1A shows a vertical scale component 12 and a weight 14 attached to the bottom in order to secure it in a vertical position. Column 15 lines 23-31 describe figure 12E disclosing an embodiment in which the weight is replaced with a magnet 298 attaching it to the base weight 296 or another magnet 300. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the base attachment method of Maresca with the vertical pressure tube of Lagergren in order to further secure the tube in a vertical position or if the tank was located above ground and the riser pipe support was not as long.

It would have been obvious to one of ordinary skill in the art at the time of invention to extend the leak detection unit of the prior art to the bottom of the tank as taught by Maresca and Lagergren in case the leak forms while there is a low liquid level in the tank, thus allowing the leak detection unit to function properly. Further, It would have been obvious to one of ordinary skill in the art at the time of invention to combine

the mounting teachings of Lagergren in view of Maresca with the admitted prior art to ensure a strong vertical support for a lowered leak detector since any change in angle from perpendicular to the liquid would cause the potential leak rate to be miscalculated as higher than it truly is.

Regarding **claim 29**, Maresca discloses an embodiment in which the "first end is detachably attached to the bottom plate with a magnet." It would have been obvious to one of ordinary skill in the art at the time of invention to combine the base attachment method of Maresca with the vertical pressure tube of Lagergren in order to further secure the tube in a vertical position or if the tank was located above ground and the riser pipe support was not as long.

Regarding **claim 32**, paragraph [0004] of the cited prior art describes a method of calibration by taking a temperature reading within the leak detector while the liquid is stopped. This reads on calibrating "the flow-rate measuring unit based on a signal corresponding to temperature of liquid being inside the flow path portion without flowing." It would have been obvious to one of ordinary skill in the art at the time of invention to use this method of calibration to ensure the flow rate of the liquid is accurate in relation to a changing temperature of the tank.

Regarding **claim 36**, the cited prior art describes a leak detecting system for use in a tank of the claimed features. The cited prior art further describes a method of calibrating the leak detector by use of a measured reference value. Since calibration requires adjustment of the detector, a "controller" must be present to control this

adjustment, thus reading on the "controller configured to control the leak detector" as claimed.

Lagergren discloses a method and apparatus for storage tank leak detection having temperature compensation in which a pressure tube 24 is inserted into a tank vertically through a riser pipe 16 as seen in the figures and column 4 lines 16-20. As there is nothing holding the horizontal position of the tube constant, it would be possible to move it vertically within the riser pipe i.e. perpendicularly to the liquid level of the tank. Lagergren further states that the bottom end of the tube is installed adjacent the base of the tank. The bottom end of the tube is not however "detachably attached to the base" as claimed.

Maresca discloses a gauge for measuring liquid levels of a float variety. Figure 1A shows a vertical scale component 12 and a weight 14 attached to the bottom in order to secure it in a vertical position. Column 15 lines 23-31 describe figure 12E disclosing an embodiment in which the weight is replaced with a magnet 298 attaching it to the base weight 296 or another magnet 300. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the base attachment method of Maresca with the vertical pressure tube of Lagergren in order to further secure the tube in a vertical position or if the tank was located above ground and the riser pipe support was not as long.

It would have been obvious to one of ordinary skill in the art at the time of invention to extend the leak detection unit of the prior art to the bottom of the tank as taught by Maresca and Lagergren in case the leak forms while there is a low liquid level

in the tank, thus allowing the leak detection unit to function properly. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the mounting teachings of Lagergren in view of Maresca with the admitted prior art to ensure a strong vertical support for a lowered leak detector since any change in angle from perpendicular to the liquid would cause the potential leak rate to be miscalculated as higher than it truly is.

Regarding **claim 39**, the cited prior art describes a leak detecting system for use in a tank of the claimed features. It further discloses a "liquid retaining portion including a space configured to retain liquid flown into the leak detector" as seen in figure 17 between the areas of measuring unit 111 and liquid level LS2. This liquid is part of the liquid of the tank. A "flow path portion" is located at the bottom of the detector 110 allowing the fluid from the tank to flow into the space of detector 110 through measurement unit 111 as described in paragraph [0003], thus reading on "a flow path portion through which the space communicates with an interior of the tank and through liquid flows in and out." Paragraph [0004] describes the capability to close of ventilating path 112a to stop the flow of gas in and out of the leak detector. This ability to close the pathway reads on the "flow path opening/closing unit configured to open and close at least one end of the flow path portion." There exists a "flow-rate measuring unit" similar to the one claimed in the prior art which would measure the rate of flow of liquid flowing into and out of the flow path portion of the detector 110, reading on the flow-rate measuring unit as claimed. Paragraph [0004] describes a method for calibrating the leak detector 110. Since the reference value calculated is for liquid-flow-rate, this reads

on the "calibrating unit" as claimed and it is "configured to calibrate the flow-rate measuring unit." The cited prior art further describes a method of calibrating the leak detector by use of a measured reference value. Since calibration requires adjustment of the detector, a "controller" must be present to control this adjustment, thus reading on the "controller configured to control the leak detector" as claimed.

Lagergren discloses a method and apparatus for storage tank leak detection having temperature compensation in which a pressure tube 24 is inserted into a tank vertically through a riser pipe 16 as seen in the figures and column 4 lines 16-20. As there is nothing holding the horizontal position of the tube constant, it would be possible to move it vertically within the riser pipe i.e. perpendicularly to the liquid level of the tank. Lagergren further states that the bottom end of the tube is installed adjacent the base of the tank. The bottom end of the tube is not however "detachably attached to the base" as claimed.

Maresca discloses a gauge for measuring liquid levels of a float variety. Figure 1A shows a vertical scale component 12 and a weight 14 attached to the bottom in order to secure it in a vertical position. Column 15 lines 23-31 describe figure 12E disclosing an embodiment in which the weight is replaced with a magnet 298 attaching it to the base weight 296 or another magnet 300. It would have been obvious to one of ordinary skill in the art at the time of invention to combine the base attachment method of Maresca with the vertical pressure tube of Lagergren in order to further secure the tube in a vertical position or if the tank was located above ground and the riser pipe support was not as long.

It would have been obvious to one of ordinary skill in the art at the time of invention to extend the leak detection unit of the prior art to the bottom of the tank as taught by Maresca and Lagergren in case the leak forms while there is a low liquid level in the tank, thus allowing the leak detection unit to function properly. Further, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the mounting teachings of Lagergren in view of Maresca with the admitted prior art to ensure a strong vertical support for a lowered leak detector since any change in angle from perpendicular to the liquid would cause the potential leak rate to be miscalculated as higher than it truly is.

Allowable Subject Matter

Claims 20, 21, 23, 25, 30, 31, 33 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Shabman whose telephone number is (571) 270-3263. The examiner can normally be reached on M-F 7:30am - 5:00pm, EST (Alternating Fridays Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Pendleton can be reached on (571) 272-7527. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MS

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